(7) *B.C.G. Vaccination.*—Its adoption in this country for certain susceptible groups is welcomed.

(8) *Examination of Contacts.*—Contact examination is extremely important and is comparable to mass radiography in that it discovers tuberculosis in persons who do not admit to being ill. The local health authority should assist through health visitors in encouraging contacts to be examined.

Care and Aftercare

The object of care work is to prevent deterioration in the living standards of the patient and his family. Sources from which assistance can be obtained are (1) the National Assistance Board, which has wide powers for assisting tuberculous families; (2) the welfare committee of the local health authority, which may provide a wide range of help in kind; (3) the voluntary care committee, giving help from charitable funds; and (4) private charitable trusts existing in a few areas for the benefit of local residents.

The provision of home helps is in many cases essential, and every effort should be made to further this service.

It is stressed that in all schemes the health visitor and the almoner are the vital link between the home and the source of assistance.

Rehabilitation

The restoration of the patient to employment is, as the report points out, again a matter for co-operation. It depends upon the employers, the chest physician, the officers of the Ministry of Labour, the medical officer of health, and not least the patient himself. The object of rehabilitation is to make the patient as useful a member of the community as his disability permits. Rehabilitation is both mental and physical. The majority of non-infectious patients are able to find work on their own account; the problem is almost confined to tuberculous patients who remain infectious. Special measures on their behalf take the form of village settlements, employment under the Disabled Persons (Employment) Act, and local authority employment schemes assisted by the Ministry of Labour.

Village settlements, numbering about half a dozen, have done valuable pioneer work, which should be continued, but it is thought that there is no case for each local authority setting up its own settlement. Accommodation in night sanatoria and hostels for people in ordinary industry should be provided. Under the Disabled Persons (Employment) Act, employers are required to have a quota of 5% of registered disabled in their employment; persons substantially disabled by tuberculosis should be encouraged to register. A final recommendation is for the extension of "Remploy" factories by the establishment of local workshops. "Remploy" factories are built by the Disabled Persons' Employment Corporation specially for tuberculous persons. There is also the special problem of rehabilitation of students suffering from tuberculosis. The development of some scheme to enable the student to continue with his studies while still under medical supervision would be of great value. Sanatoria for this purpose have been established in France and Switzerland.

This comprehensive and forward-looking report should receive the attention it deserves from the appropriate Ministries, the regional hospital boards, and the local authorities. In its proposals for the organization of the chest service and the staffing of chest clinics and sanatoria it lays down lines along which regional and local schemes may effectively proceed.

Half a century has passed since the first distribution of the Nobel Prizes. During this time a total of 242 scientists, authors, and peace champions from twenty-three different nations have been awarded prizes totalling Kr. 28.000,000 (£1,900,000). In order to commemorate the jubilee the Nobel Foundation in Stockholm has issued two almost identical volumes, one in Swedish and one in English, in which a number of representative writers review Alfred Nobel and his life's work as well as the Nobel laureates and their achievements. (*Nobel—The Man and his Prizes*, pp. 620, edited by the Nobel Foundation and published by Sohlmans Förlag, Stockholm, Kr. 30.)

EXPERIMENTS ON THE NERVOUS SYSTEM

PROFESSOR ADRIAN'S LECTURE

The nineteenth Stephen Paget Memorial Lecture, given under the auspices of the Research Defence Society, was delivered by Professor E. D. Adrian, O.M., on November 22. Sir Henry Dale, O.M., was in the chair.

Professor Adrian took as his subject "Experiments on the Nervous System." In discussing the role of animal experiment in this connexion he said that it was true that the bodies of different living creatures were not all alike, and experiments on animals could never completely show what happened in bodies like our own. The work on sulphonamides and on the antibiotics had been based on long-drawn-out animal experiment, but the final experiment was on man. Between man and animals there were some differences in their reactions to drugs and considerable differences in the nature of the infections from which they suffered. But the testing of new remedies on animals before they were used on man had saved an immense amount of sickness and death. If it had been necessary to make all preliminary experiments on man, it would have taken many years to reach anything like the present control over bacterial disease.

Advances in chemotherapy had depended on a knowledge of the general defensive mechanisms of the body, and these were much the same in man and in animals. With most of the special organs the differences were not so important as to prevent a great deal from being learned about the human organ from a study of the corresponding organ in animals. Operations now made on the human heart could be planned by experiments on dogs before they were carried out on babies with congenital heart disease. The nervous system, however, was in a special category, at least as regards its highest level, the brain.

The hearts of different mammals varied in size and shape, but the variations were not much greater than those between one make of motor-cycle and another. One heart was built for speed and another for reliability, but both were blood pumps and worked with the same cycle of operations and the same kind of valve. The differences between the brain of a man and of a rabbit, however, were of quite another order. They were best realized by considering the kind of life that man lived as compared with the rabbit. The human brain, like the elephant's trunk or the giraffe's neck, was an organ developed to a special degree in one species and responsible for behaviour peculiar to that species. Man's dominant position in the animal world had depended on the evolution of the human brain, which had made human behaviour far more intelligent than that of any other animal. Man could control his environment in a manner which no other kind of animal attempted. That was why so much reliance had to be placed on observations and experiments on man if mental disorders were to be understood and treated. Animal experiments were necessary also, but the knowledge to be gained from them came at a much earlier stage. They showed the general plan of the central nervous system, but they could not be expected to cover all the ground.

Investigation of Mental Disorders

Another difficulty arose from the fact that in most mental diseases it was impossible to find what material change had taken place, what had gone wrong with the organization of nerve cells and fibres on which mental processes depended. The abnormal working of the brain could be apprehended from the patient's abnormal behaviour, but often enough no brain lesion could be detected with any certainty. There were a few conditions in which the pathology was known, such as general paralysis of the insane and the alcoholic psychoses, but with the rest they were faced only with symptoms. Many people had been seriously concerned when they read of treatments in mental hospitals in which the human brain was subjected to violent disturbance or permanent mutilation. These critics could now be wise after the event, but the history of these new methods of treating mental disorders was instructive, for it showed how much medical men were handicapped when they

moved outside the field within which animal experiment could give a direct answer.

Professor Adrian then discussed the place of insulin and electric convulsion therapy and leucotomy in the treatment of mental disorders.

Fortunately there was now another source of information about the human brain, deriving from the great advances which had been made in neurosurgery. The exposure of the brain was a much less formidable undertaking than it was when Victor Horsley began to remove cerebral tumours. It was possible to explore the brain surface by electrical methods, and maps could be constructed, comparing with more complete maps made from the brains of the larger apes. The human brain could be stimulated electrically with the patient fully conscious. The procedure was not painful, and the patient could say what he felt or what came into his mind. Thus the work of Penfield and his colleagues in Montreal had afforded new information about the brain which could not be derived from studies on animals, although it could not have been looked for had not studies on animals prepared the way for it.

The Place of Animal Experiment

So far he had dealt only with disorders at the highest level of the central nervous system. High-level activities were developed in man, and accurate information about them could not be expected from animal brains. Advances must come mostly from what could be found out from patients. Experiments on patients were justifiable up to a point when the subject was willing and there was little risk of permanent injury. When the subject was insane and the risk appreciable, the only kind of experiment which could be made was one which, if successful, would give direct benefit to the patient himself. Animal experiments, therefore, had played little part in deciding the present trend in psychiatric treatment. Most of the data had had to be obtained by observation or experiment on man; therefore progress was bound to be slow. On the other hand, many disorders affected the lower part of the nervous system, and here there was quite enough likeness between the human nervous system and that of animals to throw light on the general plan and way of working of the nervous machinery. An essential step in the understanding of these disorders was the accurate mapping of the nervous system and a knowledge of the function of the different pathways. Here the lecturer described the work of Sherrington and other investigators, and touched on some of the achievements of modern neurology in war and peace.

In conclusion he said that he might seem to have assumed that if experiments were made on animals there must be some proportion between the pain inflicted and the benefit gained. That rule was just, but it was a rule which, fortunately, needed to be applied very rarely indeed. The days were long past when operations on animals, as on man, had to be made without anaesthetics, and in the great majority of experiments on the nervous system the animal was anaesthetized and never regained consciousness. If the animal survived there might be paralysis or loss of sensation, but severe pain—the kind of pain which was experienced when the skin was cut—was quite inadmissible, even on the most utilitarian ground, because it would almost inevitably make the experiment valueless.

Pain was an experience of the mind rather than of the body. In unconsciousness one did not feel pain, and yet the sensitive nerve endings and nervous pathways might be sending up urgent signals which would evoke severe pain if the brain were able to receive them. On their way to the brain these signals might give rise to many of the bodily reactions which accompanied pain, such as rise of blood pressure, deeper breathing, widening of pupil, and tension of muscles. These could be studied in completely unconscious animals, because they occur in the decerebrate preparation in which the whole of the forebrain has been destroyed under anaesthesia.

Traditional beliefs died hard, and there was still a tradition that experiments on animals must be painful, and it was natural and right that people should be concerned with this, and those who carried out experiments had the responsibility of making sure that their concern was needless. In the days before anaesthetics experiments on animals were undoubtedly painful, but whether one approved of them or not it must be remembered that very many people had profited by them. Anaesthetics were introduced a hundred years ago, and the experiments of Magendie in 1822, from which he showed the complete separation of motor and sensory functions, and which shocked our forefathers and quickened the anti-vivisection movement, could now be made quite painlessly.

Reports of Societies

TREATMENT OF BELL'S PALSY

A meeting of the Section of Otology of the Royal Society of Medicine was held on December 1, at which Mr. TERENCE CAWTHORNE read a paper on the pathology and surgical treatment of Bell's palsy. Mr. D. F. A. NEILSON was in the chair.

The researches of Sir Charles Bell into the function and diseases of the facial nerve, or "respiratory nerve of the face," to use his own nomenclature, had led in the first half of the nineteenth century to his name being attached to all forms of facial paralysis, no matter what the underlying cause might be. In 1893 Gowers was able to distinguish such obvious causes as injury, infection, and new growth from the true Bell's palsies, those due "to a neuritis within the Fallopian canal."

Mr. CAWTHORNE stated that in a series of 270 cases of facial paralysis under his care he had found that Bell's palsy was responsible for 157 (58%). The disease affected chiefly those between the ages of 20 and 60 years, and men were slightly more prone to the condition than women.

Because the disease did not cause death, histological material was rarely available, and the pathology had not been established; but from his operative findings he was able to state that the lesion lay in the trunk of the facial nerve at or near the stylo-mastoid foramen. Swelling of the nerve was probably the result of ischaemia, and this might be the result of exposure to cold. The consequent compression of the nerve trunk in the bony Fallopian canal would impair the transmission of neural impulses. Mr. Cawthorne described the appearance of the nerve as seen through the binocular operating microscope, and said that the nerve appeared to be unduly constricted at the point where it left the stylo-mastoid foramen and fine haemorrhagic streaks were to be seen running up the length of the nerve for a few millimetres. Above the constriction the nerve was swollen. In three cases of long-standing paralysis the trunk was found to be a shrunken fibrous strand.

Of 151 cases of severe Bell's palsy, within two months 75 (50%) had completely recovered, 19 (12%) had made a partial recovery, and 57 (38%) showed no signs of improvement. The worst prognosis for spontaneous recovery was found in those in whom the facial paralysis was complete and the faradic responses were absent.

Ballance and Duel in 1932 had treated severe cases by exposure and "decompression" of the nerve at the stylo-mastoid foramen and in the lower part of the Fallopian canal.

The speaker said that where the paralysis had remained complete for a month the likelihood of spontaneous and complete recovery was remote, and if in addition the responses to faradic stimulation had been lost he advocated decompression of the nerve. In this direction lay the best chance of good recovery. He stressed that, valuable as were electrical stimulation and splintage of the paralysed side of the face, they contributed nothing to the treatment or relief of the lesion responsible for the palsy. The operation was best done in the second month of the disease. The nerve was exposed through a post-aural incision, and, after the trunk had been identified, as much of the mastoid cortex was removed as would allow of free access to the lower part of the nerve. Slitting up of the sheath and manipulation of the nerve demanded the utmost gentleness and was best done under the binocular operating microscope by an experienced surgeon.

Probably 75% of all cases of Bell's palsy which had lasted a[illegible]t, but fre-
q[illegible] the facial